

**REMARKS**

Claims 1-3 and 7-10 are all the claims pending in the application. Claim 1 has been amended for purposes of further clarity, and support for the amendment can be found, for example at page 8, lines 10-13 of the present specification.

Entry of the above amendment is respectfully requested.

**I. Response to Rejection of claims 1-3 and 7-10 under 35 U.S.C. § 112, 1<sup>st</sup> paragraph**

Claims 1-3 and 7-10 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

The Examiner asserts that the specification does not enable one of ordinary skill in the art to feed the fluorine gas and/or ammonia gas "in portions," since the step of "passing fluorine gas and ammonia gas through a first inlet and passing ammonia gas through a second inlet, as disclosed at page 6, lines 8-21 of the present specification would not constitute feeding the fluorine and ammonia "in portions," but would merely constitute a continuous process in which the ammonia and fluorine are continuously injected into the reactor.

Applicants respectfully traverse the rejection.

The Examiner appears to have an issue with the use of the phrase "in portions." However, Applicants can be their own lexicographers. In this case, the fluorine gas and the ammonia gas can be either fed in one lot or fed in portions (e.g., separately from different inlets) as discussed at, for example, page 6, lines 8-21 of the present specification. In addition, "in portions" can mean at different positions on the reactor. The present specification contains an example (Example 3) where a two-part system was used and ammonia gas was fed at two

different positions of the reactor (i.e., a position in the inlet part and at a position in the center part of the reactor).

Given the disclosure in the specification, discussed above, it is respectfully submitted that the specification does comply with the enablement requirement, and does enable a person skilled in the art to make and/or use the invention, without undue experimentation.

In view of the above, withdrawal of the rejection is respectfully requested.

**II. Response to Rejection of claims 1-3 and 7-10 under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph**

Claims 1-3 and 7-10 are rejected under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, as allegedly being indefinite.

The Examiner asserts that it is not clear whether the "fluorine gas and/or ammonia gas" in the last line of claim 1 is required to be the same fluorine gas and ammonia gas as recited earlier in the claim. In addition, the Examiner asserts that the phrase "in portions" is indefinite since the embodiment disclosed on page 6, lines 8-21 of the present specification would not constitute feeding "in portions."

Applicants respectfully traverse the rejection.

Initially, it is noted that claim 1 has been amended to change "fluorine gas and/or ammonia gas" to "the fluorine gas and/or the ammonia gas," since these are the same fluorine gas and ammonia gas as recited earlier in the claim.

The Examiner states that claim 1 is indefinite because it recites "in portions." Again, it is respectfully submitted that Applicants can be their own lexicographers and direct the Examiner to the disclosure at page 6, lines 8-21, which describes that the gases are preferably fed in

portions when the concentrations are high and may be fed in one lot when the concentration is low. In addition, the disclosure describes that feeding in portions means, for example, passing  $F_2$  gas and  $NH_3$  gas (one portion of the total amount of  $NH_3$  gas) through a first inlet and passing  $NH_3$  gas (another portion of the total amount of  $NH_3$  gas) through a second inlet. Further, the Examiner's attention is directed to Example 3 of the present specification, which uses a two-part system where one portion of the ammonia gas was fed at a position in the inlet part and another portion of the ammonia gas was fed at a position in the center part of the reactor.

In view of the above, it is respectfully submitted that claim 1 is definite and complies with §112, second paragraph. Accordingly, withdrawal of the rejection is respectfully requested.

**III. Response to Rejection of claims 1-3 and 7-10 under 35 U.S.C. § 103**

Claims 1-4, 7 and 8 under rejected 35 U.S.C. §103(a) as allegedly obvious over JP '411.

The Examiner asserts that the reasons for the rejection are the same as that set forth in the previous Office Action. In addition, the Examiner asserts that the advantage of feeding the fluorine gas through a first inlet and the ammonia gas through a second inlet would not distinguish from the feeding method of JP '411.

Applicants respectfully traverse the rejection and submit that JP '411 does not teach or suggest the present invention.

The present invention according to claim 1 is directed to a process for producing nitrogen trifluoride, comprising reacting fluorine gas with ammonia gas in a gaseous phase, wherein the reaction is performed at 70°C or less in the presence of a diluting gas, wherein the

concentration of fluorine gas fed is 3 mol % or less and the concentration of ammonia gas fed is 6 mol % or less, and wherein the fluorine gas and/or the ammonia gas is fed in portions from two or more gas inlets. The present invention is characterized in that nitrogen trifluoride is effectively obtained from fluorine gas and ammonia gas while preventing the explosion of the fluorine gas and the ammonia gas, by separately feeding the starting gases at low concentrations of 3 mol % or less of the fluorine gas and 6 mol % or less of the ammonia gas, and by feeding either one or both of the fluorine gas and the ammonia gas in portions from two or more gas inlets to prevent the reaction temperature from rising. *See* page 7, line 31 to page 8, line 13.

JP '411 neither teaches nor suggests that the starting gases are fed at the claimed concentrations or that the fluorine gas and the ammonia gas are fed in portions from two or more gas inlets.

Therefore, JP '411 does not teach or suggest the present invention according to claim 1, and does not render the present invention obvious.

In addition, as seen from Example 3, when ammonia gas is fed at two different positions, unexpectedly superior results are provided. That is, the yield of  $\text{NF}_3$  gas in Examples 1 and 2 was 69% and 42 %, respectively, whereas the yield of  $\text{NF}_3$  gas in Example 3 was 76%.

Further, claims 9 and 10 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over JP '411 in view of JP '624.

Each of claims 9 and 10 depend, directly or indirectly, from claim 1. Therefore, it is respectfully submitted that these claims are allowable for at least the same reasons as claim 1 since JP '624 does not make up for the deficiencies of JP '411.

In view of the above, withdrawal of the rejections is respectfully requested.

**IV. Conclusion**

For the foregoing reasons, reconsideration and withdrawal of the §112 and 103 rejections, and allowance of claims 1-3 and 7-10 are respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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